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ABSTRACT

The SUCCESS program is a series of interactive computer programs designed to enhance student empowerment by allowing entering college freshmen to use computers in an environment of personal control and autonomy. To determine the effect of SUCCESS programs on students' perceived locus of control and empowerment, a study was conducted at New York's Bronx Community College of two entering freshmen classes in fall 1995 (n=35). The experimental class received six SUCCESS assignments over 14 weeks related to basic college survival information and calculations of grade point averages and financial aid data. Students worked in pairs or triads and three tutors were available to assist in lab work. The Nowicki-Strickland Internal-External Control Scale was administered to both groups at the beginning and again at the end of their first semester to determine differences in student sense of power versus helplessness, persistence with parents in achieving goals, and perception of luck as a determinant in obtaining goals. Comparison of pre- and post-test scores for both groups indicated that students who completed the SUCCESS assignments did not shift significantly with respect to overall perceived control of reinforcement and there were no significant differences between the experimental and control groups' sense of persistence with parents. The SUCCESS students did however perceive luck as having a considerably lesser effect on the attainment of desired outcomes than the control group. Contains 16 references. (TGI)

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ED 390 478

The Effect of Computer-Assisted Student Development Programs on Entering Freshman Locus of Control Orientation

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SUMMARY

This study was conducted at Bronx Community College for the entering freshmen group, during the Fall of 1995. The sample consisted of two intact freshmen classes (n=35). The treatment group (n=18) received six (6) SUCCESS interactive program assignments over a period of 14 weeks. The control group (n=17) did not use the computer during this 14-week period. The Nowicki-Strickland Internal-External Control Scale (NS-IE) was chosen for its applicability and ease of administration. All 35 students were pretested as intact groups first week prior to the first SUCCESS programming assignment. The NS-IE was again similarly administered to all students on the concluding day of the 14 weeks of the fall semester. Only the Luck factor showed a significant internal shift for the experimental group. This finding may mean that the student who completed the SUCCESS assignments and used computers changed their perception of the importance of luck in the attainment of goals from what it has been prior to the study. This shift may represent the students' belief that greater personal control is responsible for their success with this powerful technology. A perception within members of the experimental group could have developed that successful completion of their computer assignments is a function of their own input, and that success does not just happen as a result of chance combinations of learned commands. Thus, the data suggest that learning with SUCCESS may facilitate in students an "empowerment," or a greater awareness of themselves as being the controlling agents of their environment.

THE EFFECT OF COMPUTER-ASSISTED STUDENT DEVELOPMENT PROGRAMS ON ENTERING FRESHMEN LOCUS OF CONTROL ORIENTATION

The recent proliferation of computer use in schools has led to many claims concerning the impact that computers may have on students. Although research evidence is lacking, the potential for affective benefits to computer-using students has been proposed in the literature (Fisher, 1984). One of the more frequently cited advantages of the computer, putting the student in control (Luehrmann, 1980; Mullan, 1984; Raphael, 1976; Tipps, 1982), may provide the vehicle for such affective change.

SUCCESS is a series of interactional programs that allow a substantial opportunity for entering college freshmen to operate the computer in an environment of personal control and autonomy. Riordan (1982) and Watt (1982) suggest that computer use of interactive program places the learner in charge. One potential effect of using SUCCESS may be the development in the student of a generalized "empowering" effect. Empowerment, according to Papert, may be derived from a perceived "mastery over technology," which results in the student "gaining a greater and more articulate mastery of the world, a sense of the power of applied knowledge..." (Papert, 1971, p. 1). One way to operationalize and subsequently measure this notion of empowerment may be through the established construct of perceived locus of control (Louie, 1985).

Locus of control (LOC) is a psychological construct developed from the social learning theory of Julian Rotter (1966). In this theory, persons are described as perceiving that reinforcements, or events, are either (a) contingent upon the individual's own behavior or (b) the result of forces beyond the individual's control. This perceived control is measurable along an internal-external continuum. Individuals are said to be internal if they perceive themselves to be better able to exercise some control over the events in their lives. Conversely, individuals with an external orientation perceive the events in their lives as being determined largely by luck, fate, or powerful others (Rotter, 1966).

This study was about entering college freshmen operating within a CAI environment. It was designed to assess the effect of SUCCESS interaction programs and computer use on the students' perceived locus of control and to test the notion of "empowerment."

PROCEDURE

This study was conducted at Bronx Community College for the entering freshmen group, during the Fall of 1995. The sample consisted of two intact freshmen classes (n=35). The treatment group (n=18) received six (6) SUCCESS interactive program assignments over a period of 14 weeks. These structured, interactive assignments consisted of (a) midterm test of survival information in college; (b) computing gpa for the semester, computing cumulative gpa and computing degree gpa; (c) computing the required gpa to avoid academic probation and academic suspension; (d) computing the number of degree credits that must be completed to avoid academic probation and academic suspension; (e) calculating financial Pell (Federal Assistance) package; (f) calculating the gpa and number of

credits required to continue in Tuition Assistance Program (TAP). The SUCCESS interactive softwares were programed by this author using an authoring EZ language.* Three tutors were on hand to assist the entering freshmen in the computer lab work.

Students worked in pairs, and in some cases triads, during their interactive encounter with the computer. The control group (n=17) did not use the computer during this 14-week period.

INSTRUMENT

The Nowicki-Strickland Internal-External Control Scale (NS-IE) was chosen for its applicability and ease of administration. The NS-IE is a 26-item, forced-choice test in which participants circle yes or no responses. The answers are scored in such a manner that a higher score indicates greater externality.

Internal item consistency estimates of this instrument range from .3 to .7 for adolescent group (Nowicki and Duke (1974). Three factors have been shown to exist (Nowicki, 1976) within the instrument. Factor 1, Power versus Helplessness (Questions 8, 9, 15, 18, 21, and 23), deals with the subjects' feelings of power or success in making people and things do what they want them to do. One example of this factor on the instrument is, "When you do something wrong, is there little you can do to make it right again?" It was hypothesized that the computer treatment would affect the subjects' responses to these questions, making the posttest

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*Professor Henry Africk of the Mathematics Department of New York City Technical College tutored this author in every single phase of writing the SUCCESS computer-interactive program.

mean reflect a more internal orientation relative to the control group.

Factor 2, Persistence-in-dealing-with-parents (Questions 6,7,10,13, 16,19,22, and 24), deals with the subjects' use of persistence in obtaining goals and in dealing with powerful others. A sample item of this factor is, "Most of the time do you find it easy to get your own way at home?" This factor did not seem consistent with the predicted affective benefit associated with the SUCCESS interactive programs. Results on this factor, therefore, were not expected to indicate greater internalization.

Factor 3 (Questions 2,4,5,11,12, and 17), the Luck factor, deals with the subjects' perceptions of luck as a determinant in obtaining goals.

GREATER POSTTEST VERSUS PRETEST

Internalization with respect to this factor was expected. More specifically, given the nature of the items on these three factors, it was predicted that greater internalization would occur on Factors 1 and 3, but not on Factor 2.

All 35 students were pretested as intact groups first week prior to the first SUCCESS programming assignment. The NS-IE was again similarly administered to all students on the concluding day of the 14 weeks of the fall semester.

RESULTS

A one-way (treatment versus control) analysis of covariance was used to test for differences between groups, with posttest scores as the dependent variable and the pretest scores as the covariate (pretest X = 10.06, SD = 2.49; posttest X = 9.81, SD = 1.28) (See Table 1). In

comparing adjusted posttest scores between the two groups, treatment and control, the ANCOVA proved not to be statistically significant ($F(1,33) = .776$, $p > .05$). However, a global measure of LOC may not yield a full picture of these data due to the suggested multidimensional nature of the construct (Mirels, 1970).

In comparing each of the three factors in the NS-IE (Power versus Helplessness, Persistence, and Luck), the adjusted posttest scores differed significantly between two groups on the Luck factor ($F1,33) = 5.409$, $Mse = .711$, $p = .025$). One-way analyses of Factor 1, Power versus Helplessness ($F(1,33) = 1.543$, $p> .05$), and Factor 2, Persistence-in-dealing-with-parents ($F(1,33) = 2.16$, $p > .05$), did not yield statistically significant differences.

The results of the PPNS-IE indicated that the students who completed their computer-based assignments did not shift significantly with respect to overall perceived control of reinforcement. However, on one of the predicted factors, perceived Luck as a determinant in obtaining goals, the experimental group did indicate greater internality in the adjusted posttest scores relative to the control group. As predicted, the treatment group scores on the Persistence-in-dealing-with-parents factor did not change significantly in relation to the control group, but the predicted significant internal change for the scores on the treatment versus control group's Power factor did not occur.

This finding may mean that the student who completed the SUCCESS assignments and used computers changed their perception of the importance of luck in the attainment of goals from what it has been prior to the study. Specifically, these limited results indicated that the SUCCESS

students perceived luck as having a considerably lesser effect on events or the attainment of desired outcomes than the control students. This finding may be due to their 14 weeks of scheduled interaction with the computer.

CONCLUSIONS

This sample of entering college freshmen functioned for 14 weeks in a computerized environment characterized by problem solving and personal control. Results using this sample may have implications for computers in counseling and education. The computer is viewed by the student as a powerful element within their environment (Watt, 1982). For the students to perceive themselves as having gained mastery of over these machines can, as Papert (198)) says, be a "heady" experience. Based on our predictions, an overall internal shift in the experimental group may have been expected, yet no significant difference was found. A short intervention period (approximately 14 hours in one semester) may have affected this lack of significance (Burton & Magliaro, 1986).

Only the Luck factor showed a significant internal shift for the experimental group. This shift may represent the students' belief that greater personal control is responsible for their success with this powerful technology. A perception within members of the experimental group could have developed that successful completion of their computer assignments is a function of their own input, and that success doesn't just happen as a result of chance combinations of learned commands. Thus, the data suggest that learning with SUCCESS may facilitate in students an "empowerment," or a greater awareness of themselves as being the

controlling agents of their environment (Louie, 1985; Papert, 1971, 1980; Rotter, 1966).

REFERENCES

Burton, J. & Magliaro, S. (1986, April). Problem solving and computer programming instruction. Paper presented at the annual meeting of the American Education Research Association, San Francisco.

Fisher, G. (1984). The social effects of computers in education. Electronic Learning, 3, 26, 28.

Gilmore, T. M. (1978). Locus of control as a mediator of adaptive behavior in children and adolescents. Canadian Psychological Review, 19, 1-26.

Louie, S. (1985, August). Logo and research in the United States. In T. Lough (Chair), Logo in the United States. Panel conducted at the meeting of the World Conference of Computers in Education. Norfolk, VA.

Luehrmann, A. (1980). Should the computer teach the student, or vice-versa? In R. Taylor (Ed.), The computer in the school, pp. 129-135. New York: Teachers College Press.

Mirels, H. L. (1970). Dimensions of internal versus external control. Journal of Consulting and Clinical Psychology, 40, 148-155.

Mullan, A. (1984). Children and computers in the classroom. London: Castle House.

Nowicki, S. & Duke, M. P. (1974). An internal-external control scale. Developmental Psychology, 10, 874-880.

Nowicki, S. (1976). Factor structure of locus of control. The Journal of Genetic Psychology, 129, 13-17.

Papert, S. (1971). Teaching children thinking (Artificial Intelligence Memo No. 247). Boston, MA: Massachusetts Institute of Technology, A.I. Laboratory.

Papert, S. (1980). Mindstorms: Computers, children, and powerful ideas. New York: Basic Books.

Raphael,B. (1976). The thinking computer. San Francisco: CA: W. H. Freeman.

Riordan, T. (1982). The Logo environment. The Computing Teacher, 10, 46-50.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological monographs, 80, 1-28.

Tipps, S. (1982). Tipps for teachers. National Logo Exchange, 1, 3-5.

Watt, D. (1982). Teaching turtles: Logo as an environment for learning: Popular Computing, 2, 88-91.

Table 1

Mean Pretest and Mean and Adjusted Means Posttest Scores for the Luck Factor

Group	n	Pretest		Posttest			
				Obtained		Adjusted	
		X	SD	X	SD	X	F
Treatment	18	2.944	1.259	2.833	.858	3.04	5.41*
Control	17	4.176	1.190	4.0	1.000	3.79	

*p = .025